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Source Contaminant Control for the Heat Melt Compactor

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Sponsoring Program(s)

Human Exploration and Operations Mission Directorate
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Project Description

The Logistics Reduction and Repurposing project includes the heat melt compactor (HMC), a device that compacts waste containing plastic into a tile that will minimize volume, and may be used as materials for radiation shielding. During the process, a small purge gas stream is directed through the HMC chamber to transport out gasses and humidity released from the process. NASA Marshall Space Flight Center is tasked with developing and delivering a contamination control system to clean the purge gas prior to exhausting it back into the cabin for crew inhalation.

HMC source contaminant control sorbent bed.

HMC source contaminant control catalytic oxidizer.

HMC original trash and final tile product.

Anticipated Benefits

Storage and reuse of waste products are needed to support deep space missions with limited resupply. The HMC is a device that compacts waste containing plastic into a tile that will minimize volume, and may be used as construction materials for radiation shielding and other applications. The contaminant control system for the exhaust will allow purge gasses to be exhausted back into the habitable volume, preserving critical atmosphere to maintain crew survivability.

Potential Applications

Potential applications are for deep space transport and orbiting habitats, as well as nonterrestrial surface habitats. The design of the contaminant control system lends itself to other in-space processes such as additive manufacturing that potentially produces air-borne contaminants.

Notable Accomplishments

The design, fabrication, and testing of a two-stage source contaminant control system for the HMC was completed. Components were delivered to NASA Ames Research Center for integration into their generation 2 HMC scheduled for demonstration in 2015.